

REMARKS

This application has been reviewed in light of the Office Action dated May 25, 2005. Claims 1-24 are presented for examination. Claims 1, 3, 4, 8, 9, 11, 12, 16, 17, 19, 20 and 24 have been amended to define still more clearly what Applicant regards as his invention. Claims 2, 5-7, 10, 13, 14, 18, 21 and 22 have been amended as to matters of form only. No change in scope is either intended or believed effected by at least these latter changes. Claims 1, 9 and 17 are in independent form. Favorable reconsideration is requested.

The specification has been amended to conform the Summary of Invention section to the amended claims.

Applicant notes with appreciation the indication that Claims 2, 10 and 18 would be allowable if rewritten so as not to depend from a rejected claim. Those claims have not been so rewritten because, for the reasons given below, the respective base claim of each is believed to be allowable.

The Office Action objected to the drawings as failing to comply with 37 C.F.R. § 1.84(p)(5) on the grounds that (1) item 10 of Figures 1 and 2 are not mentioned in the description and (2) the drawings fail to include the item 3600 referenced in the description on page 17, lines 17-18.

Applicant has carefully reviewed and amended the specification to include references to item 10 of Figures 1 and 2, on page 2, lines 8, 10-12 and 16, as suggested by the Examiner, and has made minor amendments to those paragraphs for clarification. No new matter has been added. Applicant also has carefully reviewed and amended Figure 36 to include item 3600, as suggested by the Examiner. It is believed that the objections to the drawings have been remedied, and their withdrawal is, therefore, respectfully requested.

The Office Action objected to the specification based on the informalities set forth in paragraph 3, page 2 of the Office Action. Applicant has carefully reviewed and amended the specification in accordance with the Examiner's suggestions. Accordingly, Applicant submits that the objection to the specification has been remedied, and its withdrawal is, therefore, respectfully requested.

Claims 8, 16 and 24 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

The claims have been carefully reviewed and amended as deemed necessary to ensure that they conform fully to the requirements of Section 112, second paragraph, with special attention to the points raised in paragraph 6, page 4 of the Office Action. Specifically, Claim 8 has been amended to replace the phrase "determining pixels of said inside of said object" with the phrase "determining inner pixels of the object, the inner pixels being pixels inside the object." Similar amendments have been made with respect to Claims 16 and 24. It is believed that the rejection under Section 112, second paragraph, has been obviated, and its withdrawal is, therefore, respectfully requested.

Claims 1, 3-9, 11-17 and 19-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,437,793 (Kaasila), in view of U.S. Patent No. 5,438,656 (Valdes).

As shown above, Applicant has amended independent Claims 1, 9 and 17 in terms that more clearly define what he regards as his invention. Applicant submits that these amended independent claims, together with the remaining claims dependent thereon, are patentably distinct from the cited prior art for at least the following reasons.

Claim 1 is directed to a method of rendering objects. The method includes, for each object within a scanline, the steps of (1) determining each boundary pixel that

overlaps both sides of a border of the object; (2) computing a real opacity of each boundary pixel, wherein the real opacity of the boundary pixel is dependent upon (a) an intrinsic opacity of the object, (b) winding counts for subregions of the boundary pixel, and (c) values representative of the areas of the respective subregions with respect to the total area of the boundary pixel; and (3) rendering each boundary pixel by compositing using the corresponding computed real opacity.

Kaasila relates to the scan conversion, or pixel rendering, of outline fonts and other graphic elements with anti-aliasing, by using a method of calculating pixel coverage values as a non-linear function of the coverage values of horizontal and vertical sampling lines, for the purpose of producing more accurate estimates of coverage values. Kaasila discusses the inaccuracies that can be caused by using only two sampling lines. For example, as shown in Figures 13 through 16 of Kaasila, if the portion of pixel 110 which is covered by a shape 166 having a horizontal top edge 168 moves upward in a vertical direction, the average percentage of the two sampling lines 164 and 166 which are covered makes a large jump as the top edge 168 of the shape crosses over the horizontal sampling line 164 (see column 9, lines 4-10). If the pixel coverage value were calculated as the average of line coverage values, the pixel coverage value would jump from being approximately one quarter in Figure 14 to over three quarters in Figure 15, even though the actual percent of the pixel which is covered had changed by only a small percent (column 9, lines 14-20).

Kaasila discusses a method of (1) calculating the degree of coverage of one or more sampling lines which run in a first direction (such as a horizontal direction) within a given boundary pixel; (2) calculating the degree of coverage of one or more sampling lines which run in a second direction (such as a vertical direction) within the boundary

pixel; and (3) calculating the pixel's coverage, or grayscale, value as a nonlinear function of the coverage values of the lines running in different directions (column 9, line 61 - column 10, line 2). According to Kaasila, use of a non-linear function allows the contribution of the various line coverage values to vary as a function of those line coverage values themselves, and eliminates the large discontinuities in pixel coverage value created by small changes in the percent in the pixel which is covered when the pixel coverage value is calculated as a linear function of the two sampling values. (Column 9, lines 38-43).

Applicant submits that nothing has been found in Kaasila that would teach or suggest computing a real opacity of each boundary pixel, wherein the real opacity of a the boundary pixel is dependent upon (a) an intrinsic opacity of the object, (b) winding counts for subregions of the boundary pixel, and (c) values representative of the areas of the respective subregions with respect to the total area of the boundary pixel, as recited in Claim 1.

The Office Action states on page 5 that "the Office interprets the coverage calculations of Kaasila to disclose using 'intrinsic opacity of the object' as Kaasila discloses the use of prior pixel coverage values, these values, when taken over the entire area of the character, represent the coverage value of the character or object as a whole." Applicant disagrees. The prior pixel coverage values of Kaasila are limited to boundary pixels, as opposed to the intrinsic opacity of the object, as recited in Claim 1. Further, the pixel coverage value of a partially covered pixel according to Kaasila is proportional to the percent of the pixel which is covered by one or more high resolution shapes (column 2, lines 52-56). That is, "coverage" is directed to the relationship between the shape to be rendered and the display grid. If the placement of the shape changes, so too does the

coverage. By contrast, in the method of Claim 1, the intrinsic opacity of an object is fixed and does not change with placement.

Thus, for at least the above-stated reasons, Kaasila does not teach or suggest computing a real opacity of each boundary pixel, wherein the real opacity of a the boundary pixel is dependent upon (a) an intrinsic opacity of the object, (b) winding counts for subregions of the boundary pixel, and (c) values representative of the areas of the respective subregions with respect to the total area of the boundary pixel, as recited in Claim 1.

In addition, Applicant submits that nothing in Kaasila would teach or suggest “rendering each boundary pixel by compositing using the corresponding computed real opacity,” as recited in Claim 1 (emphasis added). Kaasila merely discusses the rendering of pixels and does not disclose rendering by compositing, as recited in Claim 1.

Valdes does not remedy the deficiencies of Kaasila. Valdes relates to a method of synthesizing multi-level raster shapes directly from outlines describing ideal shapes. The raster shape is synthesized by dividing a plane into a plurality of pixel areas according to a pixel grid, and by representing the shape as one or more arcs in the plane. Valdes discusses assigning coverage values to each pixel in the plane. However, nothing has been found in Valdes that would teach or suggest (1) computing a real opacity of each boundary pixel, wherein the real opacity of the boundary pixel is dependent upon (a) an intrinsic opacity of the object, (b) winding counts for subregions of the boundary pixel, and (c) values representative of the areas of the respective subregions with respect to the total area of the boundary pixel; or (2) rendering each boundary pixel by compositing using the corresponding computed real opacity, as recited in Claim 1.

Accordingly, Applicant submits that Claim 1 is patentable over Kaasila and Valdes, whether considered separately or in any permissible combination (if any).

Independent Claims 9 and 17 are apparatus and computer program claims, respectively, corresponding to method Claim 1, and are believed to be patentable over Kaasila and Valdes for at least the same reasons as discussed above in connection with Claim 1.

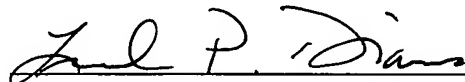
A review of the other art of record has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are, therefore, believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully request favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Leonard P. Diana", written over a horizontal line.

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